

An exploratory study on perceived online learning experience of university students during the COVID-19 pandemic

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ABSTRACT

The COVID-19 pandemic accelerated the pace of online learning amidst the health crisis unprecedentedly. Students worldwide witnessed the transition of the education system from physical classes to virtual mode and adapted themselves to accommodate the challenges and sustain the learning process. This study was carried out to understand the emotional factors and student engagement in various activities during the pandemic and to examine the perceived learning experience. The present study explored the perceived experience of university students in online learning in India. The study used a survey method and data was collected using a structured questionnaire. Results showed that students adapted to online education in the later phase better than the initial stage. The study reported increased stress levels among students. A two-way group analysis of selected variables (gender, age, stress, and loneliness) on perceived learning issues demonstrated significant results. The study's findings revealed students' experiences in online learning practice and develop the scope for further discussions to improve the learning process in online settings.

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1. INTRODUCTION

The magnitude of the health crisis caused by the COVID-19 pandemic affected almost every aspect of our day-to-day life, but the education system underwent a massive overhaul across the world. According to the United Nations report in 2020, the pandemic resulted in an unprecedented situation in the education system by affecting 1.6 billion learners in 190 countries worldwide [1]. Furthermore, several researches highlighted that students from low-income families and developing countries were highly vulnerable to continuity of education [2]–[4]. In a way, the pandemic accelerated the quick adoption of e-learning platforms [5], but many students could not get the benefit [6], [7] due to several reasons such as affordability, poor living conditions, and lack of internet connectivity, among other reasons.

The last two years have seen an upsurge in the research publication on this theme of COVID-19 and its impact on education, which provides further insights into different emerging themes. A study conducted in Bangladesh [8] showed the impact of pandemic on the education and learning pattern and revealed that students could not focus on studies due to lack of concentration, and increased anxiety levels which affected the learning process. Another study in Sri Lanka on nursing undergraduate students [9] also uncovered the difficulties faced

by the students during this time and its impact on the learning outcomes. Similarly, the research in the South East Asian context highlighted the prevalence of anxiety, depression and stress among students [10]. Finally, in the scoping review on pandemic and mental health of students reveal that female students pursuing final year courses at higher education institutions (HEI) were more vulnerable to learning issues [11].

Pham and Ho [12] reported that private universities quickly followed the global trend of e-learning and adopted innovative practices proportionally more than government institutions in Vietnam. The government-funded educational institutions had to evolve and support students who belong to geographically and socio-economically disadvantaged. The internal political conditions of developing countries mattered a lot in imparting the changes in education during the pandemic, as they had to control the spread of the disease or manage the economic crisis. The example of Afghanistan demonstrated how education has been inaccessible in countries with political instability along with other factors such as lack of facilities, affordable internet packages and efficiency of educational institutions in developing countries [13].

A study conducted in Finland explained the significant impact on the emotional well-being of students after the COVID-19 outbreak [14]. Increased anxiety levels were reported among students at the beginning of the pandemic when educational institutions closed [15], [16]. In addition, lockdowns and closure of campuses pushed students from financially weaker sections into homeless in some countries [17].

The effectiveness of online learning significantly varied among the students with access to technology and those not privileged with such facilities [18]. The pandemic forced HEI to adapt to the situation. A review of COVID-19 impact on HEI by Sobral *et al.* [19] presented a detailed description of themes that appeared in academic research during the pandemic. The online teaching process enabled educational institutions to create learning resources to help students, though the quality of such materials was not adequately verified [20]. On the other hand, it restricted the functioning and output of HEI [21]; leadership, management, innovative practices and partnerships crucially decide the HEI mitigate the crisis [22]. Previous studies [23], [24] reported the potential problems in student assessments without proper classroom monitoring. Teachers' digital competency, access to technology and equipment and the absence of appropriate assessment tools affected online learning [25]. The pandemic catalyzed the pace of the technology-driven education system to occupy the emotional spaces of students. Bhagat and Kim [26] proposed transforming education to customized online learning by higher educational institutions. Research by O'Shea *et al.* [27] highlighted the need for an integrated mechanism to manage the new normal in education and enable students to adapt to the workplace.

Research by Edelheim [28] underlined that the pandemic changed the education system all over the world. During this time, formal learning that takes place in classrooms in the form of face-to-face interaction between teachers and students has been replaced by the use of various technological alternative modes. The development of the information society and the wide diffusion of information technology gives rise to new learning opportunities. At the same time, they challenge established views and practices regarding how teaching and learning should be organized and conducted. The premise of the present study is conceptualized in the context of students' experience in HEI in India during the pandemic. Accordingly, the research objectives of the current research are: to understand the perceived learning issues by the students, to analyze the results with significant demographic variables (age and gender) and perceived learning issues and to explore the perceived experience of students in terms of their emotional state and engagement in different activities to cope with the challenges of COVID-19.

2. LITERATURE REVIEW

The closure of educational institutions due to COVID-19 posed several challenges to the policymakers and governments to address the issue of continuity of education for students of every level in various disciplines. The literature review provides insight into the direction of the online education experience of students during the COVID-19 pandemic. The present review involves literature concerning three main themes, which are adaptation, motivation and issues concerned with online learning. This section also provides an insight into the main research studies carried out on this topic around the globe.

2.1. Adaptation to online learning

According to Alghamdi [29], students had a positive attitude toward online learning at the initial lockdown stage. Students adapted to the latest technology and their behavior was positively influenced by their attitude toward studying online [30]. Aslan *et al.* [31] reported students' engagement with online learning and other pastime activities during the COVID-19 in Turkey. The transition of education to online platforms from regular learning mode molded students to adapt to the challenges. Sharaievska *et al.* [32] identified four fundamental changes experienced by students with the swift adoption of online learning; changes in instruction mode, change in everyday schedule, increased use of technology, and decrease in academic resources.

2.2. Adaptation: significant issues

The new normal in education created a virtual learning environment but added a burden to the students in the form of new challenges [33]. Research by Guo *et al.* [34] reported that confinement at home also reduced physical activities but reported increased screen time. Some significant issues reported in developing countries in common were lack of personal space for learning, low internet connectivity, access to mobile phones/computer, and anxiety about careers [4], [12], [13], [35], [36]. Previous research also reflected high levels of stress among students [15], [16], high levels of depression [37], [38], and increased risk of any vital suffering and other psychological complications [39], [40] during the pandemic period. Students studying arts and humanities subjects reported more stress than those from medical courses in United Arab Emirates [41]. Research conducted in Mexico showed that feelings associated with online learning demonstrated a pattern of internal stress [42].

2.3. Adaptive motivation

Adaptive motivation led to high student engagement [43]. Further, social support [44] addressing role conflicts [45] and peer-to-peer and teacher-student interactions developed a conducive environment for online learning. Students' academic development is directly related to the quality of the learning environment. As the lockdown continued, online education improved the learning environment [46]. Research conducted among pre-doctoral students in a U.S. Dental school revealed that students had favorable attitudes toward online learning and improved academic performance [47]. On the contrary, research by Mucci-Ferris *et al.* [48] reported the transition to online has a negative experience among students and their academic performance.

The level of student engagement varied according to the level of education and other sociodemographic characteristics [40]. According to Barrot *et al.* [49], the pandemic exposed the iniquities within the education system, risk of drop-outs [50] adversely affected undocumented students who could not access regular education due to socioeconomic issues [51]. Transformation of education would be effective only when the education system and the stakeholders synchronize with the realization of student needs [52].

To summarize, the COVID-19 pandemic resulted in new domain of research dedicated to student-centric learning issues, learning management, intervening factors of the learning process, adoption of technology and gadgets and the peripheral environment. There has been a plethora of research studies reported during the pandemic and its impact on higher education in the Indian context. These studies highlight the different research approaches, contexts, methodologies, and instruments used in the educational context. The present exploratory study will serve as a tool for exploring and furthering the research to understand the perceived learning issues by the students, during the COVID times in Indian universities.

3. RESEARCH METHOD

The present research is a quantitative, cross-sectional, descriptive and non-experimental study type. The research used an online questionnaire to explore the perspective of learners and their attitudes toward e-learning during COVID times. The researchers have examined the self-reported questionnaire with statistical and interpretive analysis.

3.1. Instruments

A questionnaire was employed to collect data from students enrolled in universities. The questionnaire contained three sections. The first part deals with demographic information, while the second part describes students' involvement, adaptation and stress-related (six dichotomous questions that examined stress, students' involvement in various activities during COVID-19, such as involvement in sports, yoga, learning new skills and adaptation to online learning). The final part examines online learning issues (nine statements to assess the respondents' level of agreement on online learning issues on a five-point Likert scale). The questionnaire was developed from the themes that emerged from interactions with students, which was sent to two experts in the field of education to check the questions and statements. The face validity was tested with a set of 30 respondents.

3.2. Sampling and data collection

The sampling in the current research was the non-probabilistic type to collect the required data. The study used an online survey method and the questionnaire was sent randomly to the university students pursuing various courses at diploma, undergraduate, postgraduate and doctoral levels. Students were requested to share the questionnaire with their peer groups studying in other universities who attended online classes during the pandemic. The guidelines proposed by Eysenbach [53] were followed in the online survey process. In total, 190 filled questionnaires were received within two months. After removing 30 inconsistent replies and or incomplete questionnaires, 160 responses were used for the present study.

3.3. Analysis

The data analysis process included multiple levels. At the first level, the calculated frequency distribution of all three sections to understand the general structure of responses was done. Exploratory factor analysis (EFA) with principal component analysis (PCA) was employed in the second level to extract the emerging factors. In the next phase, construct reliability was verified and confirmatory factor analysis (CFA) was performed to confirm the validity of constructs. Then, subgroup analysis was conducted to test the difference between two demographic variables (age and gender) on the dependent variable 'perceived learning issues'. At the last stage, the interaction effect was measured with demographic variables age, gender, stress and loneliness with the dependent variable 'perceived learning issues'. SPSS 22 software was used for descriptive analysis, EFA and interaction analysis and analysis of moment structures (AMOS) for CFA and subgroup analysis.

4. RESULTS

4.1. Descriptive statistics

Table 1 presents the details of the respondents who participated in the survey. Most respondents were above 20 years (82%, cumulative of 21-23 and above 23). The proportion of males to females was marginal, as the recorded difference was 8%. Postgraduates consisted of 49% and 30% of respondents belonged to undergraduate streams. Students from humanities represented 39% of the sample, whereas 34% belonged to social science and 27% of respondents were from science, technology, engineering and management (STEM).

Table 1. Respondents profile

	Profiles	Count	Percentage
Age group level	18-20	27	16.9
	21-23	72	45.0
	Above 23	61	38.1
	Total	160	100
Gender	Male	85	53.9
	Female	75	46.1
	Total	160	100
Education level	Pursuing Undergraduate	48	30
	Pursuing Postgraduate	79	49.4
	Pursuing Ph.D.	18	11.3
	Others	15	9.3
	Total	160	100
Discipline	Humanities	62	38.8
	Social Science	54	33.8
	STEM	40	25
	Others	4	2.4
	Total	160	100

Table 2 depicts the activities and perceived stress of students during the pandemic. There were 61% of respondents joined new online programs to acquire knowledge and skills; 77% of respondents agreed that they used the opportunity to learn new skills during the lockdown; and 66% of respondents relied on indoor sports to reduce boredom and make themselves fit and productive. In comparison to sports, fewer respondents preferred yoga or meditation to manage stress. A total of 57% respondents reported that the pandemic added stress to their lives, whereas 35% of respondents felt loneliness.

Table 2. Activities/engagements by students during COVID-19

S. N.	Attributes		Count	Percentage
1	Joined new online courses	Yes	98	61.20
		No	62	38.80
2	Acquired new skill	Yes	123	76.90
		No	37	23.10
3	Practiced yoga	Yes	68	42.50
		No	92	57.50
4	Participated in sports	Yes	106	66.30
		No	54	33.70
5	Felt Stress	Yes	90	56.50
		No	70	43.50
6	Felt loneliness	Yes	56	35.00
		No	104	65.00

The results presented in Table 3 indicate that a higher proportion of students (77%) adapted to online learning after March 2021 compared to the first phase of COVID-19 (61%). This shows that online learning was not common in Indian context before the pandemic, and students were used to attend regular classes and preferred face-to-face interactions. However, with the expansion of this pandemic, institutions were forced to adopt online teaching and learning mechanisms. In this process, the adaptation happened could be termed as a natural conditioning to mitigate the crisis.

Table 3. Adaptation to online learning

Adapted to online learning at the beginning of COVID 19 (March 2020-June 2020)	N	%	Adapted to online learning after a year of COVID 19 (post-March 2021)	N	%
Yes	98	61.3	Yes	123	76.9
No	62	38.7	No	37	23.1

The third section of the questionnaire contained five statements that explore the orientation towards learning and four that examine online learning issues during the pandemic. The same has been presented in the Table 4. The results indicated students felt they could use their free time and study more but agreed that the actual learning was less. More than half of the students agreed to increased engagement with social networking sites. A mixed response was reported on orientation change among students during COVID-19 (39% agreed that orientation changed, but 43% agreed with the negative statement ‘nothing changed’). The last section contained four statements that assessed the key online learning issues felt by students. The cumulative scores (agreed+strongly agreed) of the four statements clearly indicate that students agreed upon a lack of opportunities for teamwork, missed combined learning opportunities, missed specific details and lacked a friendly environment in the online sessions.

Table 4. Frequency table of the items in the study

Sl. No	Item	Strongly disagree (%)	Disagree (%)	No opinion (%)	Agree (%)	Strongly agree (%)
1	Expected to study more	3.8	10.6	16.9	45.6	23.1
2	Actual learning was less	3.1	27.5	15.6	41.9	11.9
3	Engaged in social networking	6.9	28.7	7.5	39.4	17.5
4	Orientation changed	4.4	22.5	23.8	38.8	10.5
5	Nothing changed	6.3	23.8	15	42.5	12.5
6	Fewer opportunities for teamwork	7.5	25.6	22.5	27.5	16.9
7	Fewer opportunities for collaborative learning	5.0	12.5	29.4	41.9	11.3
8	Missed minute details	1.9	9.4	19.4	50	19.4
9	Lacked a friendly environment	4.4	17.5	20.6	39.4	18.1

4.2. Exploratory factor analysis

The reliability test of nine items was tested to conduct EFA. The reported reliability coefficient was .60 and after the removal of one item ‘no change in life’ the reliability score (Cronbach’s α) improved to .62. Three factors emerged from the EFA (eigenvalue>1) which reported total variance explained was 64.52%. After testing the reliability score of three factors, it was found that only one factor qualified for the further analytical process. EFA was again performed after removing the five items with low factor loading. Key indices of factor analysis demonstrated scores acceptable for further analysis. Bartlett’s test of Sphericity and Kaiser-Meyer-Olkin (KMO) measures of sampling adequacy (MSA) were at an acceptable range (Bartlett’s test of Sphericity ($p<05$), KMO index of MSA>.70). According to Tabachnick and Fidell [54], a score above MSA of .60 is the threshold value for good factor analysis.

Four items explained a total variance of 62.42%. The rotated component matrix presented the output that one component loaded 4 items (fewer opportunities for collaborative learning (.85), missed teamwork (.80), lacked friendly environment (.79), and missed minute details (.73). The factor was named as ‘perceived learning issues’. The reported reliability coefficient (Cronbach’s α) of the four items was .80, which shows good internal consistency among the selected variables.

4.3. Confirmatory factor analysis

The CFA allows the researcher to confirm the theoretical proposition. The hypothesized measurement model is an evolved model from the factor analysis. The latent construct ‘learning issues’ means perceived learning issues the students face. The indicator variable ‘teamwork’ in the model refers to a lack of opportunities for teamwork, ‘comblearning’ means fewer opportunities for collaborative learning, ‘spdetails’

depicts online classes do not provide minute details (elaboration of a particular point in detail) and 'fenvt' implies lack of a friendly environment. The outcome of the first round of CFA showed that fit indices were higher than the threshold values (CMIN/DF>3, GFI=.975, AGFI=.876, TLI=.905, CFI=.968, RMSEA=.140). After checking the modification indices, a covariance was added between two variables i.e., spdetails and fenvt. The model fit measures improved considerably and all fit indices were within the acceptable range (CMIN/DF=1.930, GFI=.994, AGFI=.994, TLI=.971, CFI=.995, RMSEA=.076). Table 5 presents the factor loading and estimates.

Table 5. Results of CFA

Variable	D.V.	Loading	Estimate	S.E.	C.R.	P
Teamwork	<---Issues	0.70	1.000			
Comblearning	<---Issues	0.88	1.007	.188	5.345	***
Spdetails	<---Issues	0.49	.543	.136	3.980	***
Fenvt	<---Issues	0.63	.706	.139	5.065	***

D.V.= Dependent variable; S.E.= Standard error; C.R.=Critical ratio

4.4. Subgroup analysis

This analysis was performed to understand the role of gender in determining the impact on learning issues. The calculated effect size is given in Table 6. Two critical issues in perceived online learning issues identified by both male and female students were the lack of opportunities for collaborative learning and teamwork. In Indian context, students have a tendency to form small groups and engage in combined learning. The pandemic restricted the movements of the students, which in turn, confined them to their virtual world.

Table 6. Grouping variable: gender

Groups	I.V	D.V.	Estimate	S.E.	C.R.	P value	SRW	SMC
Male	Teamwork	L.Issues	1.000				.698	.487
	Comblearning	L.Issues	1.007	.188	5.343	***	.884	.781
	Spdetails	L.Issues	.543	.136	3.978	***	.489	.239
	Fenvt	L.Issues	.706	.139	5.063	***	.630	.397
Female	Teamwork	L.Issues	1.000				.817	.667
	Comblearning	L.Issues	.900	.146	6.168	***	.827	.685
	Spdetails	L.Issues	.589	.116	5.089	***	.628	.395
	Fenvt	L.Issues	.807	.164	4.921	***	.609	.371

Table 7 shows that two age groups (21-23 and above 23) reported significant impact in their learning practice while they were pursuing online classes. The results show that students of both age groups preferred to have learning with friends and peers, which leads to better learning. Teachers at times, faced difficulty in explaining specific details of certain portions in online classes. In addition, the virtual setting could not create the ambience of a friendly learning environment, which the students used to have in classrooms.

Table 7. Grouping variable: age

Age group	I.V	D.V.	Estimate	S.E.	C.R.	P value	SRW	SMC
18-20	Teamwork	L.Issues	1.000				.556	.310
	comblearning	L.Issues	1.510	.604	2.498	.012	.904	.817
	Spdetails	L.Issues	1.042	.408	2.554	.011	.691	.478
	Fenvt	L.Issues	1.001	.447	2.241	.025	.568	.322
21-23	Teamwork	L.Issues	1.000				.802	.643
	comblearning	L.Issues	.937	.145	6.477	***	.897	.804
	Spdetails	L.Issues	.497	.122	4.075	***	.501	.251
	Fenvt	L.Issues	.826	.146	5.646	***	.669	.447
Above 23	Teamwork	L.Issues	1.000				.773	.318
	comblearning	L.Issues	.816	.179	4.565	***	.812	.278
	Spdetails	L.Issues	.480	.134	3.574	***	.528	.659
	Fenvt	L.Issues	.569	.149	3.816	***	.564	.598

4.5. Interaction effect between different variables and perceived learning issues

A two-way between-groups analysis was conducted to explore the impact of age and gender on the levels of perceived learning issues as measured by the scale. Participants were divided into three groups according to their age (Group 1: 18-20 years, Group 2: 21-23 years and Group 3: above 23 years). The

interaction effect between age and gender was not statistically significant $F(2, 3.011)$, $p < .05$. However, a statistically significant interaction effect between age and felt stress on perceived learning issues was reported in the two-way between-groups analysis ($F(2, 3.011)$, $p < .05$). The effect size was low (Partial eta squared = .07). Post-hoc comparison using Tukey Honestly Significant Difference (HSD) test indicated age group had no significant difference between the groups as the mean score of 18-20 age group ($M=3.47$, $SD=.90$), 21-23 age group ($M=3.42$, $SD=.89$), above 23 years ($M=3.50$, $SD=.82$). A statistically significant interaction effect between age and loneliness on perceived learning issues was found ($F(2, 6.261)$, $p < .05$). Post-hoc comparison using the Tukey HSD test indicated no significant difference between age groups. The study did not establish a statistically significant effect between gender and adaptation to online learning in the two-way interaction with the dependent variable perceived learning issues. The result did not report any statistically significant effect between age group and adaptation to online learning (pre- and post-COVID scenarios) with the dependent variable 'learning issues'.

5. DISCUSSION

The outcome of the study is highly significant in the context of a country like India. According to a report published in the Business Line, approximately 6.47 million students qualified undergraduate and 1.5 million students qualified postgraduate courses in 2018 [55]. There is a steady increase in the number of qualifying candidates from various institutions every year.

The findings reported significant issues they faced in online learning. On a positive note, students found the lockdown time to acquire new skills. The result found that students were keen to enroll in online internships and new courses such as data analytics, language learning. According to an online report, there is a surge in demand for skill-based online courses and online platforms like LinkedIn reported increased enrolment of learners and tutors [56]. The pandemic changed students' behavior as they started spending more time and amount to learn new skills as the regular academic environment was unavailable during the pandemic. The findings of our study also correlate with a study conducted by Kulkarni [57].

The psychological adversities created by the pandemic, mainly during the lockdown, are one of the widely acknowledged impacts [58]. Students were more vulnerable in this unprecedented situation [59] as the students experienced mental health issues than the general population even before the pandemic [60], [61]. Research indicated that the obligatory isolation and diminished social interactions caused during lockdown increased the feeling of loneliness [62]. Students who participated in the survey expressed their experience of stress and loneliness during the lockdown. Although, a substantial proportion of students underwent stress (56.30%) and many suffered loneliness (35%). This finding is consistent with research studies conducted in the United States [17], [32], [63], Portugal [64], the Philippines [49], and the Middle East [23] where anxiety and stress were reported by students.

In the context of India, children are supported by their family members until they complete their education. There is a great level of control over children by the parents, and relatives, which also leads to strong family bonds. During the lockdown, children could spend more time with their parents and other family members. It could be one possible reason that less proportion of students reported loneliness. The lockdown allowed strengthening the parents-children bond [65], [66]. Students' engagement with social media increased during the lockdown [34], [67], which could be perceived as a possible reason to understand why loneliness was experienced less frequently compared to stress by the respondents.

Respondents of the present research indicated that as a coping measure, they engaged themselves in physical activities, like sports and yoga. Such engagements during a stressful time can be perceived as a part of what [68] call an avoidance strategy which essentially involves making some kind of effort to avoid the source of stress. Despite having enormous awareness and acceptance of yoga in modern Indian society as an influential ancient tradition of wisdom to gain holistic health benefits [69], our findings indicated that most students preferred sports to yoga.

Regarding the utilization of time during the lockdown, most respondents agreed that they acquired new skills during this pandemic. This output corroborates the findings of previous studies related to the experience of higher education students during the pandemic, suggesting that students perceive their experience as a mix of positive and negative feelings [32], [48]. Aguilera-Hermida [70] argued that many students utilized their time for personal growth and self-improvement during the mandated closure and subsequent switch to online learning. Besides examining students' experiences in general, one of this study's primary objectives was to investigate students' learning experiences during the COVID-19 pandemic and identify their key issues. In the educational context, COVID-19 enforced the 'messy transition' [32] from in-person to fully-online education [49] or rather 'emergency remote teaching' [71] which differ from conventional online education in many ways [72] causing higher education students to face many difficulties in adjusting to this radical shift in their learning process.

At the beginning (March 2020), 61.3% of students agreed that they adapted to online learning, whereas in the next year (March 2021), an increased number of students (76.9%) reported adapting to online learning. This outcome substantiates the findings of Balta-Salvador *et al.* [46] by identifying an improvement in students' perception of adaptation to online education over six months. In a sense, this approach reflects the resilience of the student community towards the challenges posed to their academic future. It can be implied to a gradual adaptation of online education by university students, bearing in mind that institutions and faculties have also improved their preparedness and adaptability to this shift.

Nonetheless, online education has several drawbacks compared to in-person courses pointed out by scholars prior to the pandemic [73] and during the pandemic [12], [35]. The study reported that the expectations levels of students could not materialize fully to take more courses or study new topics. Although COVID changed the orientation of students to a new world of online learning, it was found that several factors determined the effectiveness of learning in online education. In a regular academic environment, students have to report to classes and perform all academic duties, whereas the digital world gives immense flexibility, reducing self-regulation skills. The effectiveness of online learning comes with proactive behavior, which comes with the acceptance of online learning and developing interest and attitudes, involvement and a creative learning environment [74].

The study identified four major issues in online learning; deprivation of teamwork, fewer opportunities for combined learning, missed specific details and lacked a friendly environment in virtual classrooms. Most of the online classes at the higher education level were 'masked classes' as the teachers were unsure of students attending the lessons seriously. Sliding through the PowerPoint presentations or videos (often interrupted by internet speed), teachers and students suffered.

The following research studies reported identical results in the context of Asia. Research by Alsoud and Harasis [35] reported the hardships of students in Jordan; research by Aslan *et al.* [31] reported issues of online learning in Turkey; research by Barrot *et al.* [49] presented online learning issues in the Philippines; research by Noori [13] highlighted the learning issues of Afghanistan; research by Pham and Ho [12] studied the online learning practices in Vietnam; research by Saravanan *et al.* [41] undertook educational issues in UAE; research by Yin [43] researched on online education in China; research by Islam *et al.* [75] studied the learning practices during COVID in Bangladesh; and research by Tiwari *et al.* [76] conducted a detailed study based on the Indian context.

The perceived difference among males and females in online learning reveals two significant issues; loss of combined learning opportunities and lack of teamwork. In terms of the degree of effect, it was found that female students depended more on friends and peer groups. However, online learning reduced opportunities for creating peer groups and deprived them of effective teamwork. This finding supports the research by Yu [77] who pointed out that online learning outcomes are inconsistent.

Examination of age groups and learning issues provided insight into varying age groups' experiences with online learning. Our study reported that the effect was significant with age groups of 20 and above on perceived online learning issues. According to Morin *et al.* [78], the age group has a predictable role in learning outcomes. Students at the college/university level tend to spend more time with friends and develop social circles. The pandemic restricted such opportunities, influencing learning outcomes as well. In our personal experience, students working in teams tend to achieve a better grasp of the subject and good results as it provides opportunities for in-depth discussions.

Another interesting observation of the study is the adaptation to online learning at the beginning of COVID-19 and the later phase. The study reported male and female students (all age groups) in India did not find much difficulty in adapting to the online learning. However, there were critical gaps in the knowledge-imparting process. It can be concluded that acceptance of technology and digital gadgets was higher among students with time. However, the adaptation process with online learning issues in the context of the study did not report a significant effect. Thus, the objectives of the study were achieved. The study explored the perceived learning issues by university students during the pandemic times and compared the results with the demographic variables (age and gender). The study further explored the perceived experience of students in terms of their emotional state and engagement in different activities to cope with the challenges of COVID-19.

6. CONCLUSION

The study delineated the students' engagement during COVID-19, the intervening roles of yoga, sports and learning new skills. The study confirmed four variables: fewer opportunities for collaborative learning, less scope of teamwork, absence of specific details and lacking friendly environment, which construed a latent construct of perceived learning issues. A detailed analysis of perceived learning issues with selected demographic variables and variables related to student engagement highlighted two critical gap areas. First, there were fewer opportunities for combined learning and less scope for teamwork. The degree of effect felt by female students on online learning issues was higher than that of male students. To conclude, the pandemic

disrupted the education system in India and brought new technology to reach out to students who stayed at home, but there were implicit gaps where underprivileged students could not access such interventions. Although two years of COVID-19 are over and there are regular improvisations in online learning, it may take more years to make the online learning program acceptable among all sections of society. Based on the experience of the COVID-19 pandemic, various governments are investing vast amounts of money in improving education infrastructure and dreaming such changes will ensure up-gradation in education standards.

The study findings will enable administrators of colleges/universities to relook into the existing online education models and incorporate necessary modifications to meet students' expectations. Irrespective of the nature of the courses, the forced entry of online learning could not sustain the long-term interests of the academic without resolving the problematic areas. Hence, the study presents two perspectives; first, upgrade the resources of educational institutions and thereby retain an interest in online learning among such students who are privileged with all facilities. The second perspective is meeting the needs of underprivileged students. In both cases, some common issues identified are gender, age group, and generating interest among students to make learning effective. In addition, peer groups and teamwork are essential components of the learning process in the context of India. Therefore, policymakers and administrators should pay attention to creating a conducive environment to develop teamwork and combined learning opportunities.

The study is conducted with a small sample size, which would restrict the generalization of the results. Another limitation could be a possibility of bias that influenced some arguments and observations raised here as the authors are part of the education system and the personal experiences in online learning reflected while preparing the manuscript. The present study has been developed within the quantitative framework and perhaps could have been complemented with the qualitative approach.

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